SI (MKS) → cgs

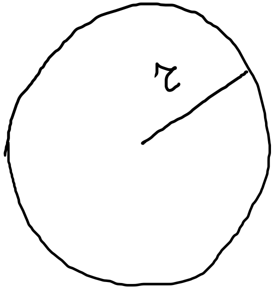
- LUNGHEZZA m

$$C = 299\,792\,458 \ \frac{m}{s} \cong 3 \cdot 10^8 \ \frac{m}{s}$$

$$\frac{1}{299\,792\,458} \ s$$

- MASSA Kg
- TEMPO s
- TEMPERATURA K
- QUANTITÀ DI MATERIA
  mol N_A $6.022 \cdot 10^{23}$
- INTENSITÀ DI CORRENTE
  A
- INTENSITÀ LUMINOSA
  cd

DIMENSIONI



$r = 1 \text{ cm}$

$A = 4\pi r^2 = 4\pi (1 \text{ cm})^2 = 4\pi \text{ cm}^2$

$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi (1 \text{cm})^3 = \frac{4}{3}\pi \text{ cm}^3$

$A + V =$ New Cuyama

$r + A =$

$[r] = [L]$

$[A] = [L^2]$

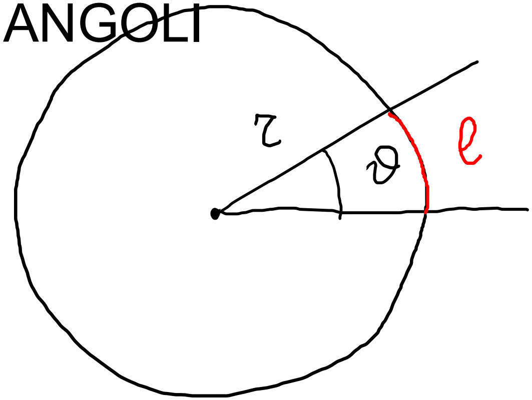
$[V] = [L^3]$

$$[m] = [M]$$

$$[F] = [M][L][T^{-2}]$$

$$[G] = [M^{\alpha}][L^{\beta}][T^{\gamma}] \ldots [H^{\delta}]$$

ANGOLI

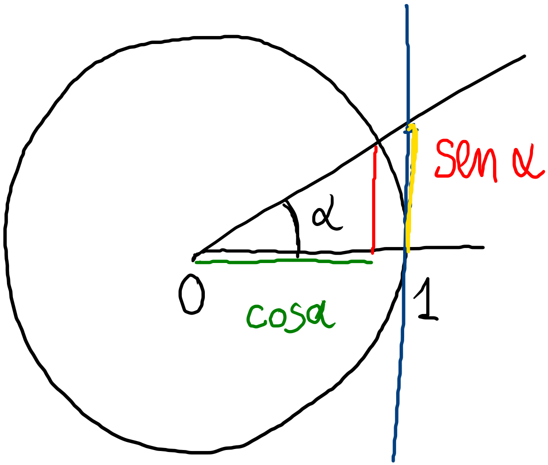


$$\vartheta = \frac{l}{r}$$

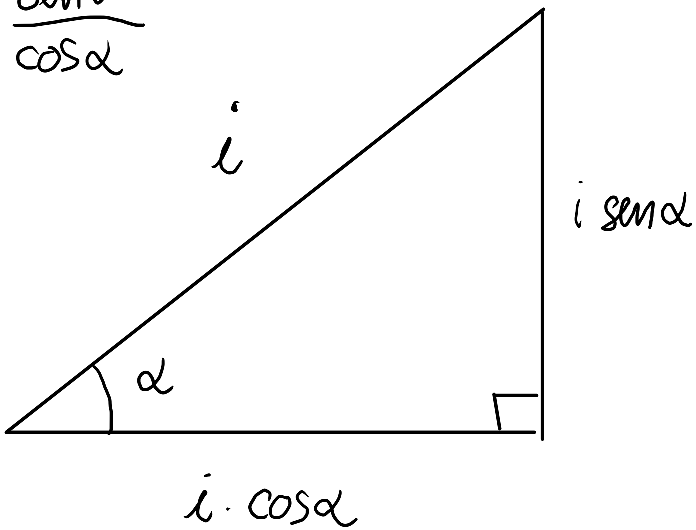
$$[\vartheta] = \frac{[L]}{[L]} = [L^0]$$

angolo giro	$\vartheta = \frac{2\pi r}{r} = 2\pi$	rad	360°
piatto	$\vartheta = \frac{\pi r}{r} = \pi$	rad	180°
retto	$\frac{\pi}{2}$		90°
	$\frac{\pi}{4}$		45°

TRIGONOMETRIA (FOR DUMMIES)



$$tg\alpha = \frac{sen\alpha}{\cos\alpha}$$



CIFRE SIGNIFICATIVE

400 m pista atletica 3 cifre significative

400 m casa – stazione 1 cifra significativa

$78,3 \times 21 = 1644,3$ $\div$

1600

1640

$78,3 + 21$

$$\begin{array}{r} 78,3 \; + \\ 21 \\ \hline 99 \end{array}$$

JOE BIDEN   5 piedi 11 pollici 1/2

piede → 12 pollici

1 pollice → 2,54 cm

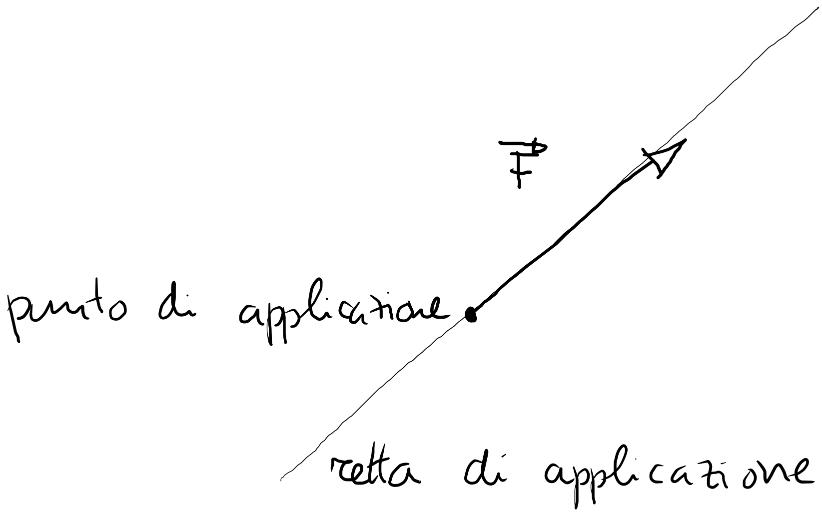
$$5\,\cancel{\text{piedi}}\underbrace{\left(\frac{12\,\text{pollici}}{1\,\cancel{\text{piede}}}\right)}_{\to\,1} + 11,5\,\cancel{\text{pollici}}\underbrace{\left(\frac{2,54\,\text{cm}}{1\,\cancel{\text{pollice}}}\right)}_{\to\,1}$$

$$60\,\cancel{\text{pollici}}\left(\frac{2,54\,\text{cm}}{1\,\cancel{\text{pollice}}}\right) + 11,5 \cdot 2,54\,\text{cm}$$

$$71,5 \cdot 2,54\,\text{cm} = 181,61\,\text{cm} = 182\,\text{cm}$$

- modulo   intensità
- direzione
- verso

} vettore

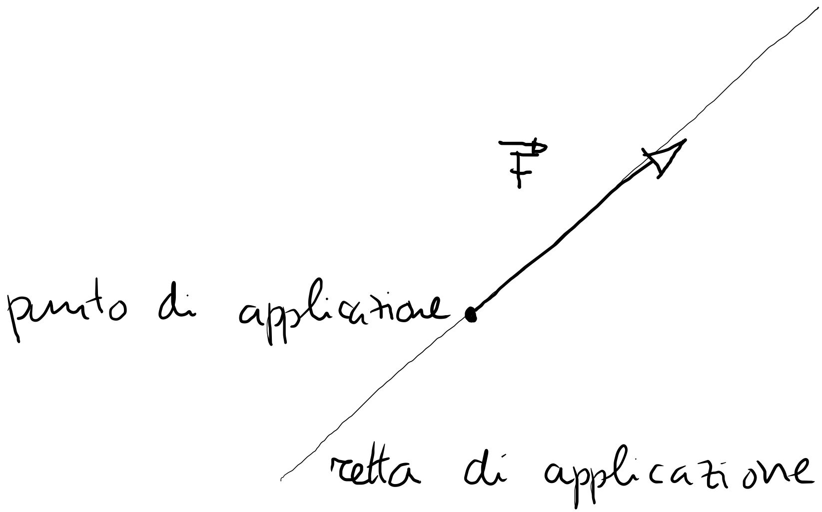


$\mathbf{F}$ $\mathbf{F}$ $\bar{F}$ $\underline{F}$ F

$|\vec{F}|$ F

- modulo   intensità
- direzione
- verso

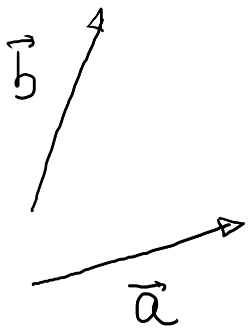
} vettore



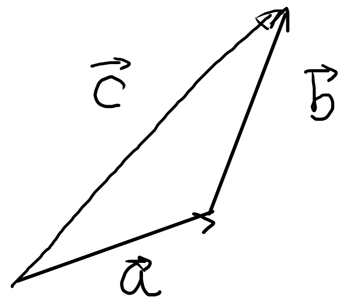
$\mathbf{F}$ $\mathbf{F}$ $\overline{F}$ $\underline{F}$ F

$|\vec{F}|$ F

SOMMA DI VETTORI

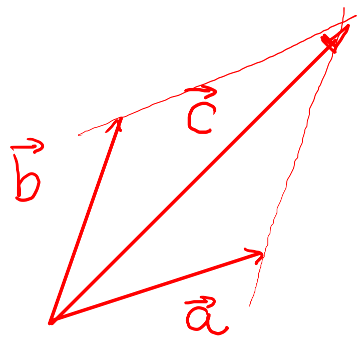


1)

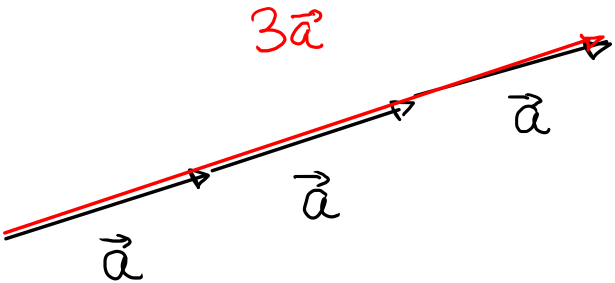


$$\vec{c} = \vec{a} + \vec{b}$$

2)



· MOLTIPLICAZIONE VETTORE × UNO SCALARE



$m\vec{a}$ $\quad m \in \mathbb{R}$

modulo $|m||\vec{a}|$

direzione quella di $\vec{a}$

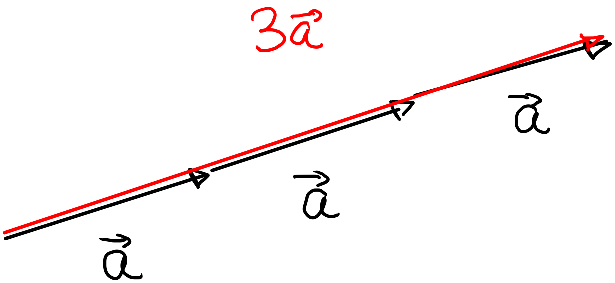
verso $m>0$ di $\vec{a}$

$m<0$ opposto ad $\vec{a}$

$-\vec{a}$

$-1 \cdot \vec{a}$ $\quad |-1| \cdot |\vec{a}| = |a|$

· MOLTIPLICAZIONE VETTORE × UNO SCALARE



$m\vec{a}$ $\quad m \in \mathbb{R}$

modulo $|m||\vec{a}|$

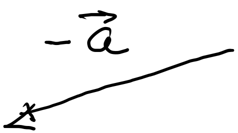
direzione quella di $\vec{a}$

verso $m>0$ di $\vec{a}$

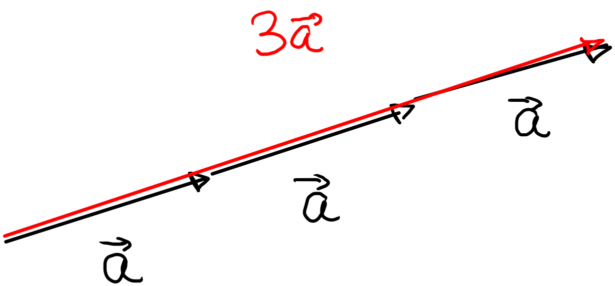
$m<0$ opposto ad $\vec{a}$

$-\vec{a}$

$-1 \cdot \vec{a}$ $\quad |-1| \cdot |\vec{a}| = |a|$



· MOLTIPLICAZIONE VETTORE × UNO SCALARE



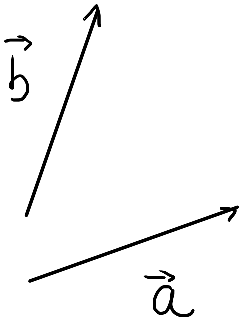
$m\vec{a}$ $\quad m \in \mathbb{R}$

modulo	$\lvert m\rvert \lvert\vec{a}\rvert$
direzione	quella di $\vec{a}$
verso	$m>0$ di $\vec{a}$
	$m<0$ opposto ad $\vec{a}$

$-\vec{a}$

$-1 \cdot \vec{a}$ $\quad \lvert -1\rvert \cdot \lvert\vec{a}\rvert = \lvert\vec{a}\rvert$

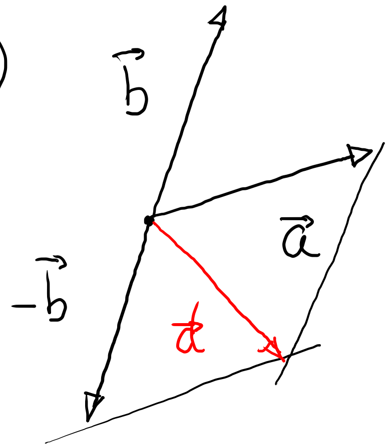
DIFFERENZA TRA VETTORI



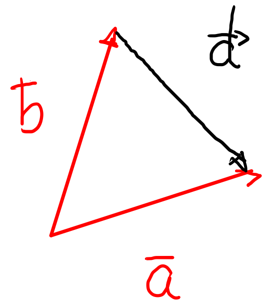
$$\vec{a} - \vec{b} = \vec{d}$$

$$\vec{a} + (-\vec{b}) =$$

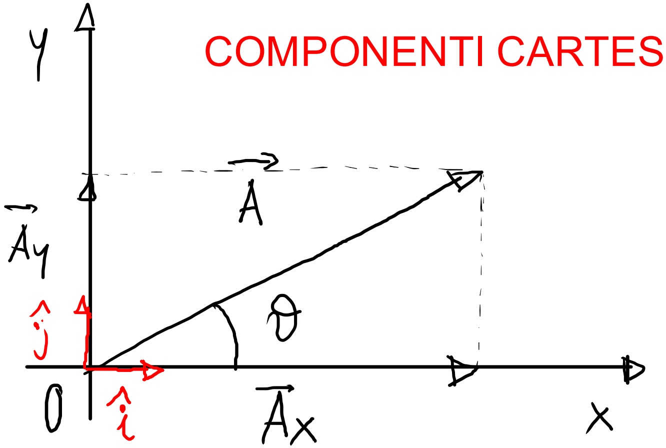
1)



2)



COMPONENTI CARTESIANE DI UN VETTORE



$$\vec{A}_x + \vec{A}_y = \vec{A}$$

$$\hat{i} \leftrightarrow \vec{i}$$

$$\vec{A}_x = |\vec{A}_x|\,\hat{i} = A_x\,\hat{i}$$

$$\vec{A}_y = |\vec{A}_y|\,\hat{j} = A_y\,\hat{j}$$

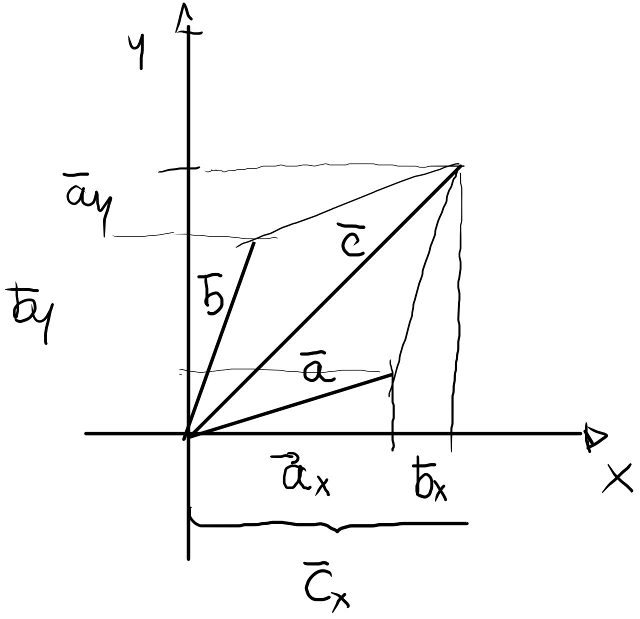
$$\vec{A} = \vec{A}_x + \vec{A}_y = A_x\hat{i} + A_y\hat{j} = A\cos\vartheta\,\hat{i} + A\,\text{sen}\,\vartheta\,\hat{j} = A(\cos\vartheta\,\hat{i} + \text{sen}\,\vartheta\,\hat{j})$$

$$A_x = A\cos\vartheta$$

$$A_y = A\,\text{sen}\,\vartheta$$

SOMMA/DIFFERENZA DI DUE VETTORI MEDIANTE LE COMPONENTI

$\vec{a} + \vec{b}$



$c_x = a_x + b_x$

$c_y = a_y + b_y$

$d_x = a_x - b_x$

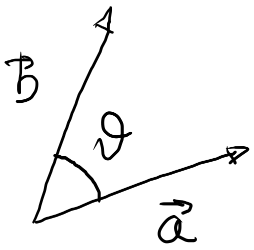
$d_y = a_y - b_y$

$\vec{a} + \vec{b} = \vec{b} + \vec{a}$

$\vec{a} + (\vec{b} + \vec{e}) = (\vec{a} + \vec{b}) + \bar{e}$

PRODOTTO SCALARE TRA DUE VETTORI

$$\vec{a} \bullet \vec{b} = |\vec{a}| \cdot |\vec{b}| \cos\vartheta$$

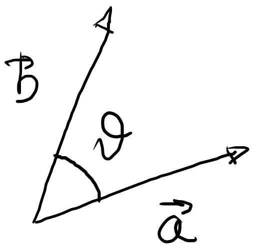


$$\vec{a} \cdot \vec{b} = a_x b_x + a_y b_y$$

$$\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$$

PRODOTTO SCALARE TRA DUE VETTORI

$$\vec{a} \cdot \vec{b} = |\vec{a}| \cdot |\vec{b}| \cos\vartheta$$



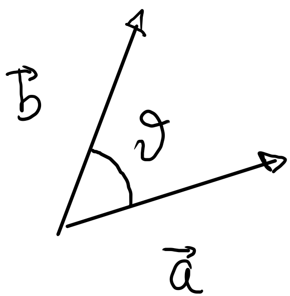
$$\vec{a} \cdot \vec{b} = a_x b_x + a_y b_y$$

$$\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$$

PRODOTTO VETTORIALE TRA DUE VETTORI

$$\vec{v} = \vec{a} \wedge \vec{b}$$

$$|\vec{v}| = |\vec{a}| \cdot |\vec{b}| \operatorname{sen}\vartheta$$



$$\vec{a} \times \vec{b} = -\vec{b} \times \vec{a}$$

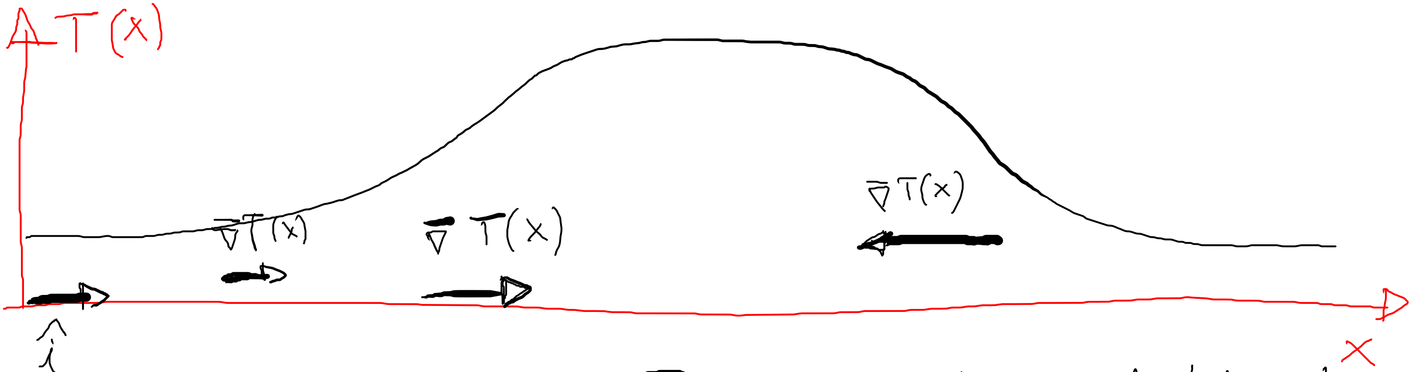
$$\vec{v} = \vec{a} \times \vec{b}$$

$$v_x = a_y b_z - b_y a_z$$

$$v_y = -a_x b_z + b_x a_z$$

$$v_z = a_x b_y - b_x a_y$$

VETTORE GRADIENTE



$$\overline{\mathbf{grad}}\, T(x) = \bar{\nabla}\, T(x)$$

$$\left|\bar{\nabla} T(x)\right| = \left|\frac{dT(x)}{dx}\right|$$

$T(x, y, z)$ 3

$T(x, y)$ 2

$$\bar{\nabla} T(x, y) = \frac{\partial T(x, y)}{\partial x} \hat{i} + \frac{\partial T(x, y)}{\partial y} \hat{j}$$

$$\bar{\nabla} T(x, y, z) = \frac{\partial T(x, y, z)}{\partial x} \hat{i} + \frac{\partial T(x, y, z)}{\partial y} \hat{j} + \frac{\partial T(x, y, z)}{\partial z} \hat{k}$$